

ANALYSIS OF DEEMED UNIVERSITY WEBSITES

IN INDIA: A WEBOMETRIC STUDY

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ABSTRACT

Today website becomes in dispensable resource among the academic institutions. Numerous researches on academic websites have been carried out using webometric tools. This paper presents an analysis of deemed universities websites in India. Out of 741 universities are functioning in India there exists 125 deemed universities comprises of 56 Arts and Science universities, 39 Engineering universities; 20 Medical universities and 10 Other subjects Universities. Among the 125 universities, 56 (44.80%) universities are having a domain name as.ac.in. It is followed by edu.in 19 (15.20%), .org 16 (12.80%) and.edu 12 (9.60%). The domain names.ernet.in; gov.in; and.nic.in are preferred least by the deemed universities especially after the year 2001. The size of the websites ranges between 1 kb and 8529 kb. The Internal Link, External Link and Size of the website for these 125 deemed universities were obtained using Web Optimization tool. The deemed university websites are dynamic and quite impressive because of their minimal website limited internal and external links even though they have a number of images.

KEYWORDS: Webometrics, Deemed Universities Websites, Website Analysis, Web Impact Factor, India, Survey

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INTRODUCTION

Today website becomes in dispensable resources among the academic institutions, since it has convenience for transforming the information to the users. Web based indicators and web performance is way to measure to the academic performance of the university. Hence it is essential to measure the performances these academic websites. The metric studies paved way for measuring the websites, the emergence of webometrics enable to identify the performance of academic websites. Web sites often provide the first impression of an organization. For many organisations, web sites are crucial to ensure sales or to procure services within. Websites can among other things gain strategic advantages for organisations such as facilitating institutional change, attracting prospective applicants, building community and sharing knowledge (Lin, 2007). Designing a Website is a complex and challenging process which deals with heterogeneous interacting components. The construction of Website has evolved some discipline, there is still a lack of systematic approach, and the entire development process is still needs pruning.

The great technological revolution has brought in a vast amount of and nearly unlimited accessibility to information. The user ability to shift through the vast sea of information has become the primary research focus in the twenty-first century. Information and knowledge present powerful tools for the advancement of personal and communal life and knowledge of positive use is imperative. The websites of higher education institutions play a

major role in communicating the world by providing useful and current information. The interdisciplinary nature of the field of Library and Information Science has caused some of the issues related to information science to be directed at related fields: technology for those involved in computer science and information systems and administration for people engaged in management and organization. Now a days the university websites play the vital role for all the aspects so this study mainly concentrate the deemed university websites in India.

Webometrics

According to Björneborn and Ingwersen (2004), the definition of webometrics is "the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the Web drawing on bibliometric and informetric approaches. The term webometrics was first coined by Almind and Ingwersen (1997). A other definition of webometrics is, "the study of web-based content with primarily quantitative methods for social science research goals using techniques that are not specific to one field of study" (Thelwall, 2009).

Status of Higher Education in India

Indian higher education system has expanded at a fast pace after the introduction of new education policy in 1986 by adding number of colleges every year due to privatization of education in India. Universities in India have evolved in divergent streams with each stream monitored by an apex body, indirectly controlled by the Ministry of Human Resource Development and funded jointly by the state governments. Indian educational institutions from 2004 consisted of a large number of technology and domain specific institutes. Distance learning and open education is also a feature of the Indian higher education system, and is looked after by the Distance Education Council. Indira Gandhi National Open University (IGNOU) is the largest Open University in the world having number of students, having approximately 3.5 million students across the globe. Most universities are administered by the States, however, there are number of universities maintained by the Union Government and Educational Trust. Therefore the administration of the university falls under the category of central universities, state universities, deemed universities, and private universities As on 2016, India has 46 central universities, 342 state universities, 125 deemed universities, and 228 private universities. (www.ugc.ac.in).

REVIEW OF LITERATURE

The academic web is a global source of expertise and also a means to communicate scientific and cultural achievements (Aguillo, Granadino, Ortega, and Prieto, 2005). The impact of electronic publications is far larger than that obtained by traditional journals and books on paper. Websites are the most efficient and cheapest way for boosting all three academic missions: teaching, research and technology transfer. Lack of visibility on the web is leading to a worrying level of academic digital divide (Aguillo, Ortega and Fernandez, 2008).

Jeysankar, Ramesh Babu and Gopalakrishnan (2009) provided conceptual frame works of Webometric Study. There are three key aspects to be measured in the academic web: Size, that is, volume of information published. Visibility, the number of 'situations' (site citations & external inlinks) the domain receives; and popularity as the number of visits or visitors of the web pages (Aguillo, Ortega and Fernandez, 2008). Webometric investigation at different levels of domain name system based on the hyperlink analysis (Mukhopadhyay 2004), Cybermetrics indicators (Aguillo, et al 2006) and ranking approaches (Jalal, Biswas and Mukhopadhyay 2009).

Jeyshankar and Ramesh Babu (2009) conducted a webometric study for websites of universities in Tamil Nadu (India). Similar patterns may also appear within a single country such as the UK (Thelwall, 2002), European countries (Thelwall, Tang & Price 2003), Latin America (Aguillo, et al 2006) and Canada (Vaughan, 2007; Vaughan & Thelwall, 2003). All these studies were conducted to know academic interlinking. It is found that universities' websites were tended to link mostly to countries geographically nearer.

Narendra Kumar, Nageswara Rao and Ramesh Babu (2008) examined the Web Credibility of State Agricultural Universities Websites in India followed by Ramesh Babu, Jeyshankar and Nageswara Rao, (2009) examined the procedure in measuring the Web Impact Factor of State Agricultural Universities Websites in India.

Ramesh Babu, Jeyshankar and Nageswara Rao (2010) analysed the websites of central universities in India and found that citation analysis and link analysis are not analogous to each other they investigated the domain systems of the websites, WIF for central universities in India and their rankings based on WIF data. Further Nageswara Rao, Narendra Kumar and Ramesh Babu (2009) analysed the Web credibility of Autonomous College Websites in Tamil Nadu and in the same year Ramesh Babu, Narendra Kumar, and Gopalakrishnan (2009) studied the credibility of University websites in Tamil Nadu. Jeyshankar and Ramesh Babu (2012) conducted a Webometric Study Websites of Indian Institutes of Management (IIMS). All the above studies did not cover deemed universities in Tamilnadu and hence this study is justified and bridges the gap in the literature on webometric analysis.

Need for the Study

Today the functions of aspects of academic institutions are measure based on their websites. It leads to numerous researches on academic websites using webometrics towards control of websites and the trustworthiness. These two are considered as a quantitative instrument for comparing the websites. The Web Impact Factor (WIF), developed by Peter Ingwersen (1998), was used as qualitative instrument to measure the impact of a website by the number of links it receives. Further three types of WIF: internal, external, overall. For internal WIF, the numerator is the number of self-link i.e. links within the website; external WIF, the numerator is the number of external inlinks i.e. links coming to a website from other websites; for overall WIF, numerator is the total links i.e. both self-links and external inlinks. Hence in this study the deemed university websites were analysed using the webometric principles of web link structure analysis i.e. internal link, external link and back link.

OBJECTIVES

The study has been designed with the following objectives:

- To identify the domain preferred by the deemed universities for their websites.
- To find out the web impact factor of deemed university websites.
- To find out the external web impact factor of deemed university websites.
- To find out the usage of internal link, external link and back link in deemed university websites.

HYPOTHESES

The following hypotheses have been framed:

- There exists uniformity in the preference of domain among deemed universities.
- There exists high web impact factor among deemed university websites.
- There exists external web impact factor among deemed university websites.
- There exists effective utilisation of internal link, external link and back link in deemed university websites

ANALYSIS AND DISCUSSIONS

At present there are 741 universities functioning in India. These universities are categorised as State Universities, Central Universities, Deemed Universities and Private Universities. The quantum of universities under each category is shown in Table 1.

Table 1: Category of Universities

S. No.	Category of Universities	Frequency	Percent	Cumulative Percent
1	State Universities	342	46.2	46.2
2	Central Universities	46	6.2	52.4
3	Deemed Universities	125	16.9	69.2
4	Private Universities	228	30.8	100.0
Total		741	100.0	

There are 342 (46.2%) state universities, followed by 228 (30.80%) Private Universities, 125 (16.90%) Deemed universities and 46 (6.20%) Central Universities. In this study 125 deemed university websites were taken up for webometric study. These deemed universities further grouped based on the year of establishment and their subject domain.

Table 2: Details About Deemed Universities

S. No.	Description	Frequency	Percentage
Based on Year of Establishment			
1	Before 1980	11	8.8
2	Between 1981 and 1990	21	16.8
3	Between 1991 and 2000	15	12.0
4	After 2001	78	62.4
Based on Domain			
1	Arts and Science	56	44.8
2	Engineering	39	31.2
3	Medical	20	16.0
4	Others	10	8.0
Total		125	100

Out of 125 deemed universities, 78 (62.40%) were established after the year 2001. Only 37.6% of deemed universities were established before 2000 of which 21 (16.8%) deemed universities were established between 1981 and 1990. Out of 125 deemed universities, 56 (44.80%) were Arts and Science universities. It is followed by Engineering Universities 39 (31.2%); Medical Universities (20, 16%) and Other Universities (10. 8%).

The deemed universities were further grouped by state wise and the same is shown in Table 3.

Table 3: State Wise Distribution of Deemed Universities vs. Year of Establishment

S. No.	Name of the State	Before 1980	Between 1981 and 1990	Between 1991 and 2000	After 2001	Total
1	Andhra Pradesh	1 (0.8)	2 (1.6)	1 (0.8)	1 (0.8)	5 (4.0)
2	Arunachal Pradesh	0 (0.0)	1 (0.8)	0 (0.0)	0 (0.0)	1 (0.8)
3	Bihar	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)	1 (0.8)
4	Chandigarh	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)	1 (0.8)
5	Delhi	3 (2.4)	3 (2.4)	1 (0.8)	3 (2.4)	10 (8.0)
6	Gujarat	1 (0.8)	0 (0.0)	0 (0.0)	1 (0.8)	2 (1.6)
7	Haryana	0 (0.0)	1 (0.8)	0 (0.0)	5 (4.0)	6 (4.8)
8	Jharkhand	1 (0.8)	1 (0.8)	0 (0.0)	0 (0.0)	2 (1.6)
9	Karnataka	1 (0.8)	0 (0.0)	1 (0.8)	12 (9.6)	14 (11.2)
10	Kerala	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.6)	2 (1.6)
11	Madhya Pradesh	0 (0.0)	0 (0.0)	1 (0.8)	2 (1.6)	3 (2.4)
12	Maharashtra	1 (0.8)	5 (4.0)	4 (3.2)	11 (8.8)	21 (16.8)
13	Orissa	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.6)	2 (1.6)
14	Puducherry	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)	1 (0.8)
15	Punjab	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.8)	2 (1.6)
16	Rajasthan	1 (0.8)	2 (1.6)	1 (0.8)	4 (3.2)	8 (6.4)
17	Tamil Nadu	1 (0.8)	2 (1.6)	2 (1.6)	23 (18.4)	28 (22.4)
18	Telangana	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.6)	2 (1.6)
19	Uttar Pradesh	0 (0.0)	3 (2.4)	3 (2.4)	4 (3.2)	10 (8.0)
20	Uttarakhand	1 (0.8)	0 (0.0)	1 (0.8)	1 (0.8)	3 (2.4)
21	West Bengal	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)	1 (0.8)
Total		11 (8.8)	21 (16.8)	15 (12.0)	78 (62.4)	125 (100)

All the 125 universities spread over 21 states in India. Out of 21 states, Tamil Nadu has a maximum of 28 (22.40%) universities, it is followed by Maharashtra 21 (16.8%), Karnataka 14 (11.20%) and Uttar Pradesh 10 (8.00%).

As per the policy of higher education each and every academic institution must have website. Accordingly, all these universities having the websites. These universities were further classified based on the domain in URL and the same is shown in Table 4.

Table 4: Domain-Wise Distribution of Websites of Deemed Universities vs. Year of Establishment

S. No.	Domain	Before 1980	Between 1981 and 1990	Between 1991 and 2000	After 2001	Total
1	.ac.in	4 (3.2)	9 (7.2)	7 (5.6)	36 (28.8)	56 (44.8)
2	.co.in	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)	1 (0.8)
3	.com	0 (0.0)	0 (0.0)	0 (0.0)	7 (5.6)	7 (5.6)
4	.edu	1 (0.8)	2 (1.6)	1 (0.8)	8 (6.4)	12 (9.6)
5	.edu.in	0 (0.0)	5 (4.0)	4 (3.2)	10 (8.0)	19 (15.2)
6	.ernet.in	1 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)
7	.gov.in	0 (0.0)	1 (0.8)	0 (0.0)	0 (0.0)	1 (0.8)
8	.in	2 (1.6)	1 (0.8)	0 (0.0)	5 (4.0)	8 (6.4)
9	.nic.in	1 (0.8)	1 (0.8)	1 (0.8)	0 (0.0)	3 (2.4)
10	.org	2 (1.6)	2 (1.6)	2 (1.6)	10 (8.0)	16 (12.8)
11	.org.in	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)	1 (0.8)
Total		11 (8.8)	21 (16.8)	15 (12.0)	78 (62.4)	125 (100)

Among the 125 universities, 56 (44.80%) universities are having a domain name as .ac.in. It is followed by .edu.in 19 (15.20%), .org 16 (12.80%) and .edu 12 (9.60%). The domain names .ernet.in, .gov.in, and .nic.in are preferred least by the

deemed universities especially after the year 2001.

The Internal Link, External Link and Size of the website for these 125 deemed universities were obtained using Web Optimization tool. Internal Link, External Link and Size of the website and the same are shown in Table 5. Based on Internal Link, External Link, Size of the website (in KB), Web Impact Factor (WIF) and External Web Impact Factor (EWIF) using the formula shown below have been calculated and also provided in the Table 5.

$$\text{External Link WIF} = \frac{\text{Number of External Link}}{\text{Number of Web Pages (In bytes)}}$$

$$\text{WIF} = \frac{\text{Number of Internal link Pages}}{\text{Number of Web Pages (In bytes)}}$$

Table 5: WIF and EWIF

S. No.	Name of the University and Location	Internal Link	External Link	Size (in Kb)	WIF	EWIF
1	Vignan's Foundation for Science, Technology and Research University, Guntur	247	43	1754.89	0.14	0.02
2	Koneru Lakshmaiah Education Foundation University, Guntur	372	29	2230.43	0.17	0.01
3	Rashtriya Sanskrit Vidyapeetha, Tirupathi	85	1	161.79	0.53	0.01
4	Sri Sathya Sai Institute of Higher Learning, Puttaparthi	32	6	25.72	1.24	0.23
5	Gandhi Institute of Technology and Management (GITAM), Visakhapatnam	116	41	3063.29	0.04	0.01
6	North Eastern Regional Institute of Science and Technology, Itanagar	65	7	867.38	0.07	0.01
7	Nava Nalanda Mahavihara, Bargaon	56	8	5990.69	0.01	0.00
8	PEC University of Technology, Chandigarh	88	19	843.80	0.10	0.02
9	Indian Agricultural Research Institute, Pusa	270	19	3042.44	0.09	0.01
10	Indain Institute of Foreign Trade, New Delhi	15	4	1734.65	0.01	0.00
11	Indian Law Institute, New Delhi	38	11	260.20	0.15	0.04
12	Institute of liver and Biliary Sciences, Vasant Kunj, New Delhi	190	10	2106.21	0.09	0.00
13	Jamia Hamdard, Hamdard Nagar, New Delhi	20	69	2934.46	0.01	0.02
14	National Museum Institute of History of Arts, Conservation and Musicology, Janpath, New Delhi	63	5	101.35	0.62	0.05
15	National University of Educational Planning and Administration, New Delhi	0	0	200.05	0.00	0.00
16	Rashtriya Sanskrit Sansthana, Janak Puri, New Delhi	92	0	2989.35	0.03	0.00
17	Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi	155	4	724.43	0.21	0.01
18	TERI School of Advanced studies, Vasant Kunj, New Delhi	158	11	2951.83	0.05	0.00
19	Gujarat Vidyapeeth, Ahmedabad	61	54	674.73	0.09	0.08
20	Sumandeep Vidyapeeth, Vadodara	0	0	0.09	0.00	0.00

Table 5: Contd.,

21	Maharishi Markandeshwar University, Mullana	42	100	2957.57	0.01	0.03
22	Lingaya's University, Old Faridabad	42	9	2019.43	0.02	0.00
23	National Brain Research Centre, Gurgaon	0	0	203.37	0.00	0.00
24	National Dairy Research Institute, Karnal	0	0	0.21	0.00	0.00
25	Manav Rachna International University, Faridabad	27	252	146.13	0.18	1.72
26	National Institute of Food Technology, Entrepreneurship & Management (NIFTEM), Sonapat	0	0	0.44	0.00	0.00
27	Birla Institute of Technology, Ranchi	370	32	520.80	0.71	0.06
28	Indian School of Mines, Dhanbad	169	81	848.20	0.20	0.10
29	B.L.D.E. University, Bijapur	81	3	200.65	0.40	0.01
30	Christ University, Bengaluru	142	43	2894.39	0.05	0.01
31	Indian Institute of Science, Bengaluru	174	88	555.54	0.31	0.16
32	International Institute of Information Technology, Bengaluru	134	17	725.13	0.18	0.02
33	Jain University, Bengaluru	156	39	1502.74	0.10	0.03
34	Jagadgura Sri Shivarathreeswara University, Mysore	215	24	1171.22	0.18	0.02
35	Jawahar lal Nehru Centre for Advanced Scientific Research, Bengaluru	46	9	143.30	0.32	0.06
36	K.L.E. Academy of Higher Education and Research, Belakavi	84	30	2508.88	0.03	0.01
37	Manipal Academy of Higher Education, Manipal	145	14	3851.42	0.04	0.00
38	NITTE University, Mangaluru	40	107	403.20	0.10	0.27
39	Sri Devraj Urs Academy of Higher Education & Research, Kolar	56	7	2266.67	0.02	0.00
40	Sri Siddhartha Academy of Higher Education, Tumkur	112	5	2638.31	0.04	0.00
41	Swami Vivekananda Yoga Anusandhana Samsthana, Bengaluru	8	79	1406.04	0.01	0.06
42	Yenepoya University, Someshwar	560	6	1545.57	0.36	0.00
43	Kerala Kalamandalam, Thrissur	0	0	160.97	0.00	0.00
44	Indian Institute of Space Science and Technology, Thiruvananthapuram	153	13	2494.72	0.06	0.01
45	Indian Institute of Information Technology and Management, Gwalior	154	11	1190.22	0.13	0.01
46	Pandit Dwarka Prasad Mishra Indian Institute of Information Technology, Jabalpur	531	90	3105.20	0.17	0.03
47	Lakshmibai National Institute of Physical Education, Gwalior	13	57	600.70	0.02	0.09
48	Bharati Vidyapeeth, Pune	66	18	1472.47	0.04	0.01
49	Central Institute of Fisheries Education, Mumbai	0	0	NA	0.00	0.00
50	D.Y Patil Educational Society, Kolhapur	112	1	46.22	2.42	0.02
51	Datta Meghe Institute of Medical Sciences, Wardha	0	2	7.30	0.00	0.27
52	Deccan College Postgraduate & Research Institute, Pune	98	7	NA	0.00	0.00
53	Dr. D.Y. Patil Vidyapeeth, Pune	181	65	NA	0.00	0.00
54	Gokhale Institute of Politics & Economics, Pune	29	7	389.51	0.07	0.02

Table 5: Contd.,						
55	Homi Bhabha National Institute, Mumbai	1	0	1781.79	0.00	0.00
56	Indira Gandhi Institute of Development Research, Mumbai	79	10	554.09	0.14	0.02
57	Institute of Armament Technology, Pune	64	36	3186.46	0.02	0.01
58	International Institute for Population Sciences, Mumbai	0	2	478.12	0.00	0.00
59	Institute of Chemical Technology, Mumbai	0	0	1300.79	0.00	0.00
60	Krishna Institute of Medical Sciences, Karad	228	11	2385.77	0.10	0.00
61	MGM Institute of Health Sciences, Mumbai	87	7	874.13	0.10	0.01
62	Narsee Monjee Institute of Management Studies, Mumbai	71	29	1238.44	0.06	0.02
63	Padmashree Dr.D.Y. Patil Vidyapeeth, Pune	204	27	0.37	549.73	72.76
64	Pravara Institute of Medical Sciences, Rahata	51	1	833.04	0.06	0.00
65	Symbiosis International University, Pune	140	68	2487.36	0.06	0.03
66	Tata Institute of Fundamental Research, Mumbai	129	57	1.39	92.63	40.93
67	Tata Institute of Social Sciences, Mumbai	124	53	2904.76	0.04	0.02
68	Tilak Maharashtra Vidyapeeth, Pune	345	9	8528.54	0.04	0.00
69	Kalinga Institute of Industrial Technology, Bhubaneswar	63	21	2825.90	0.02	0.01
70	Shiksha 'O' Anusandhan University, Bhubaneswar	28	10	572.54	0.05	0.02
71	Sri Balaji Vidyapeeth Mahatma Gandhi University, Pillaiyarkuppam	19	24	329.66	0.06	0.07
72	Sant Longowal Institute of Engineering and Technology, Longowal	0	0	3014.31	0.00	0.00
73	Thopar Institute of Engineering & Technology, Patiala	252	20	940.31	0.27	0.02
74	Banasthali Vidyapith, Vanasthali	0	0	0.08	0.00	0.00
75	Birla Institute of Technology & Science, Pilani	370	33	NA	0.00	0.00
76	Institute of Advanced Studies in Education, Sardarshahar	57	6	NA	0.00	0.00
77	IIS University, Jaipur	152	19	3732.19	0.04	0.01
78	Jain Vishva Bharati Institute, Ladnun	385	90	1548.74	0.25	0.06
79	Janardan Rai Nagar Rajasthan Vidyapeeth, Udaipur	65	1	198.34	0.33	0.01
80	LNM Institute of Information Technology, Jaipur	145	25	902.78	0.16	0.03
81	Mody Institute of Education and Research, Sikar	84	196	2981.77	0.03	0.07
82	Academy of Maritime Education and Training, Chennai	142	13	1867.11	0.08	0.01
83	Amrita Vishwa Vidyapeetham, Coimbatore	80	25	50.30	1.59	0.50
84	Avinashilingam Institute for Home Science & Higher Education for Women, Coimbatore	27	2	0.19	141.78	10.50
85	B.S. Abdur Rahman Institute of Science and Technology, Chennai	272	26	2999.72	0.09	0.01
86	Bharath Institute of Higher Education & Research, Chennai	129	22	11.26	11.45	1.95
87	Chennai Mathematical Institute, Chennai	20	5	70.36	0.28	0.07
88	Chettinad Academy of Research and Education (CARE), Kelambakkam	5	1	523.00	0.01	0.00
89	Gandhiigram Rural Institute, Dindigul	229	32	762.90	0.30	0.04

Table 5: Contd.,						
90	Hindustan Institute of Technology and Science (HITS), Chennai	267	227	2947.90	0.09	0.08
91	Kalasalingam Academy of Research and Higher Education, Krishnankoil, Virudhunagar	17	120	3046.76	0.01	0.04
92	Karunya Institute of Technology and Sciences, Coimbatore	48	44	40.89	1.17	1.08
93	Karpagam Academy of Higher Education, Coimbatore	134	3	18.98	7.06	0.16
94	M.G.R. Educational and Research Institute, Chennai	24	8	76.28	0.31	0.10
95	Meenakshi Academy of Higher Education and Research, Chennai	25	3	NA	0.00	0.00
96	Noorul Islam Centre for Higher Education, Kanyakumari	68	8	3371.90	0.02	0.00
97	Periyar Manaimmai Institute of Science and Technology (PMIST), Thanjavur	134	17	3121.21	0.04	0.01
98	Ponnaiyan Ramajayam Institute of Science and Technology (PRIST), Thanjavur	56	31	774.61	0.07	0.04
99	S.R.M Institute of Science and Technology, Chennai	314	26	931.70	0.34	0.03
100	Sathyabama Institute of Science and Technology, Chennai	144	33	1147.26	0.13	0.03
101	Saveetha Institute of Medical and Technical Sciences, Chennai	452	17	0.15	3106.36	116.83
102	Shanmugha Arts Science Technology and Research Academy (SASTRA), Thanjavur	123	24	46.79	2.63	0.51
103	Sri Chandrasekharendra Saraswathi Vishwa Mahavidyalaya, Kanchipuram	148	7	1115.65	0.13	0.01
104	Sri Ramachandra Medical College and Research Institute, Chennai	12	2	3033.03	0.00	0.00
105	St. Peter's Institute of Higher Education and Research, Chennai	121	9	199.74	0.61	0.05
106	Vels Institute of Science Technology and Advanced Studies (VISTAS), Chennai	256	5	3073.14	0.08	0.00
107	Vellore Institute of Technology, Vellore	122	35	46.13	2.64	0.76
108	Vel Tech Rangarajan Dr. Sagunthala R & D Institute of Science and Technology, Chennai	152	50	2935.74	0.05	0.02
109	Vinayaka Mission's Research Foundation, Salem	127	6	807.41	0.16	0.01
110	International Institute of Information Technology, Hyderabad	73	16	177.52	0.41	0.09
111	ICFAI Foundation for Higher Education, Hyderabad	28	9	147.09	0.19	0.06
112	Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad	0	2	370.25	0.00	0.01
113	Bhatkhande Music Institute, Lucknow	3	47	2962.09	0.00	0.02
114	Central Institute of Higher Tibetan Studies, Varanasi	0	0	629.37	0.00	0.00
115	Dayalbagh Educational Institute, Agra	76	5	930.30	0.08	0.01
116	Indian Institute of Information Technology, Allahabad	100	45	3442.56	0.03	0.01
117	Indian Veterinary Research Institute, Bareilly	191	11	2668.92	0.07	0.00
118	Jaypee Institute of Information Technology, Noida	151	16	3107.01	0.05	0.01
119	Nehru Gram Bharati Vishwavidyalaya, Allahabad	1	0	0.31	3.20	0.00

Table 5: Contd.,						
120	Shobhit Institute of Engineering & Technology, Meerut	131	61	2987.29	0.04	0.02
121	Santosh University, Ghaziabad	76	16	3753.53	0.02	0.00
122	Forest Research Institute, Dehradun	112	14	2704.95	0.04	0.01
123	Gurukul Kangri Vishwavidyalaya, Haridwar	19	136	748.56	0.03	0.18
124	Graphic Era University, Dehradun	0	0	2934.56	0.00	0.00
125	Ramakrishna Mission Vivekananda Educational and Research Institute, Kolkata	13	1	2951.30	0.00	0.00

The size of the websites ranges between 1 kb and 8529 kb. The size of the website of 6 universities cannot be obtained. The Inlinks ranges between 1 and 560 links and there is no Inlink for 15 deemed university websites. The External link ranges between 1 and 252 links and there is no External link for 15 deemed university websites. Web Impact Factor (WIF) for deemed university websites ranges between 0.01 and 3106.36. Out of 125, 24 deemed universities by WIF is 0.00. This indicates that the 24 universities may not have either inlink or size may be huge. External Web Impact Factor (EWIF) for deemed university websites ranges between 0.01 and 116.83. Out of 125, 40 deemed universities by EWIF is 0.00. This indicates that the 40 universities may not have either external link or size may be huge.

Further the ratio between internal link, external link and back link has been calculated using the formula given below and the values are shown in Table 6.

$$\text{Ratio of IL and EL} = \frac{\text{Number of Internal Link}}{\text{Number of External Link}}$$

$$\text{Ratio between IL, EL and BL} = \frac{\text{Internal link} + \text{External Link}}{\text{Back Link}}$$

Table 6: Ratio between Internal Link, External Link and Back Link

S. No.	Name of the University	Internal Link (A)	External Link (B)	Back Link (C)	Ratio of A/B	Ratio of (A+B)/C
1	Vignan's Foundation for Science, Technology and Research University, Guntur	247	43	1000	5.74	0.29
2	Koneru Lakshmaiah Education Foundation University, Guntur	372	29	1881	12.83	0.21
3	Rashtriya Sanskrit Vidyapeetha, Tirupathi	85	1	212	85.00	0.41
4	Sri Sathya Sai Institute of Higher Learning, Puttaparthi	32	6	1216	5.33	0.03
5	Gandhi Institute of Technology and Management (GITAM), Visakhapatnam	116	41	1000	2.83	0.16
6	North Eastern Regional Institute of Science and Technology, Itanagar	65	7	398	9.29	0.18
7	Nava Nalanda Mahavihara, Bargaon	56	8	1000	7.00	0.06
8	PEC University of Technology, Chandigarh	88	19	1000	4.63	0.11
9	Indian Agricultural Research Institute, Pusa	270	19	2201	14.21	0.13
10	Indain Institute of Foreigen Trade, New Delhi	15	4	3770	3.75	0.01
11	Indian Law Institute, New Delhi	38	11	321	3.45	0.15
12	Institute of liver and Biliary Sciences, Vasant Kunj, New Delhi	190	10	1000	19.00	0.20

Table 6: Contd.,						
13	Jamia Hamdard, Hamdard Nagar, New Delhi	20	69	1000	0.29	0.09
14	National Museum Institute of History of Arts, Conservation and Musicology, Janpath, New Delhi	63	5	135	12.60	0.50
15	National University of Educational Planning and Administration, New Delhi	No Link		108285	0.00	0.00
16	Rashtriya Sanskrit Sansthan, Janak Puri, New Delhi	92	0	730	0.00	0.13
17	Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeetha, New Delhi	155	4	166	38.75	0.96
18	TERI School of Advanced studies, Vasant Kunj, New Delhi	158	11	1000	14.36	0.17
19	Gujarat Vidyapeeth, Ahmedabad	61	54	1176	1.13	0.10
20	Sumandeep Vidyapeeth, Vadodara	No Link		1143	0.00	0.00
21	Maharishi Markandeshwar University, Mullana	42	100	1440	0.42	0.10
22	Lingaya's University, Old Faridabad	42	9	1000	4.67	0.05
23	National Brain Research Centre, Gurgaon	No Link		686	0.00	0.00
24	National Dairy Research Institute, Karnal	No Link		1000	0.00	0.00
25	Manav Rachna International University, Faridabad	27	252	16769	0.11	0.02
26	National Institute of Food Technology, Entrepreneurship & Management (NIFTEM), Sonapat	No Link		128	0.00	0.00
27	Birla Institute of Technology, Ranchi	370	32	128	11.56	3.14
28	Indian School of Mines, Dhanbad	169	81	1000	2.09	0.25
29	B.L.D.E. University, Bijapur	81	3	1000	27.00	0.08
30	Christ University, Bengaluru	142	43	11490	3.30	0.02
31	Indian Institute of Science, Bengaluru	174	88	83790	1.98	0.00
32	International Institute of Information Technology, Bengaluru	134	17	1000	7.88	0.15
33	Jain University, Bengaluru	156	39	1000	4.00	0.20
34	Jagadgura Sri Shivarathreeswara University, Mysore	215	24	1165	8.96	0.21
35	Jawahar Lal Nehru Centre for Advanced Scientific Research, Bengaluru	46	9	1000	5.11	0.06
36	K.L.E. Academy of Higher Education and Research, Belakavi	84	30	1128	2.80	0.10
37	Manipal Academy of Higher Education, Manipal	145	14	4632	10.36	0.03
38	NITTE University, Mangaluru	40	107	1000	0.37	0.15
39	Sri Devraj Urs Academy of Higher Education & Research, Kolar	56	7	372	8.00	0.17
40	Sri Siddhartha Academy of Higher Education, Tumkur	112	5	1000	22.40	0.12
41	Swami Vivekananda Yoga Anusandhana Samsthana, Bengaluru	8	79	4824	0.10	0.02
42	Yenepoya University, Someshwar	560	6	16423	93.33	0.03
43	Kerala Kalamandalam, Thrissur	No Link		1646	0.00	0.00
44	Indian Institute of Space Science and Technology, Thiruvananthapuram	153	13	1000	11.77	0.17
45	Indian Institute of Information Technology and Management, Gwalior	154	11	1000	14.00	0.17
46	Pandit Dwarka Prasad Mishra Indian Institute of Information Technology, Jabalpur	531	90	1883	5.90	0.33
47	Lakshmi Bai National Institute of Physical Education, Gwalior	13	57	156	0.23	0.45

Table 6: Contd.,						
48	Bharati Vidyapeeth, Pune	66	18	967	3.67	0.09
49	Central Institute of Fisheries Education, Mumbai	No Link		961	0.00	0.00
50	D.Y Patil Educational Society, Kolhapur	112	1	1000	112.00	0.11
51	Datta Meghe Institute of Medical Sciences, Wardha	0	2	998	0.00	0.00
52	Deccan College Postgraduate & Research Institute, Pune	98	7	144	14.00	0.73
53	Dr. D.Y. Patil Vidyapeeth, Pune	181	65	1000	2.78	0.25
54	Gokhale Institute of Politics & Economics, Pune	29	7	290	4.14	0.12
55	Homi Bhabha National Institute, Mumbai	1	0	804	0.00	0.00
56	Indira Gandhi Institute of Development Research, Mumbai	79	10	2704	7.90	0.03
57	Institute of Armaments Technology, Pune	64	36	389	1.78	0.26
58	International Institute for Population Sciences, Mumbai	0	2	1331	0.00	0.00
59	Institute of Chemical Technology, Mumbai	No Link		1206	0.00	0.00
60	Krishna Institute of Medical Sciences, Karad	228	11	1000	20.73	0.24
61	MGM Institute of Health Sciences, Mumbai	87	7	1000	12.43	0.09
62	Narsee Monjee Institute of Management Studies, Mumbai	71	29	10629	2.45	0.01
63	Padmashree Dr.D.Y. Patil Vidyapeeth, Pune	204	27	305	7.56	0.76
64	Pravara Institute of Medical Sciences, Rahata	51	1	1000	51.00	0.05
65	Symbiosis International University, Pune	140	68	2637	2.06	0.08
66	Tata Institute of Fundamental Research, Mumbai	129	57	8504	2.26	0.02
67	Tata Institute of Social Sciences, Mumbai	124	53	9012	2.34	0.02
68	Tilak Maharashtra Vidyapeeth, Pune	345	9	1000	38.33	0.35
69	Kalinga Institute of Industrial Technology, Bhubaneswar	63	21	4954	3.00	0.02
70	Shiksha 'O' Anusandhan University, Bhubaneswar	28	10	476	2.80	0.08
71	Sri Balaji Vidyapeeth Mahatma Gandhi University, Pillaiyarkuppam	19	24	1000	0.79	0.04
72	Sant Longowal Institute of Engineering and Technology, Longowal	No Link		494	0.00	0.00
73	Thopar Institute of Engineering & Technology, Patiala	252	20	2036	12.60	0.13
74	Banasthai Vidyapith, Vanasthali	No Link		1348	0.00	0.00
75	Birla Institute of Technology & Science, Pilani	370	33	1012	11.21	0.40
76	Institute of Advanced Studies in Education, Sardarshahar	57	6	1000	9.50	0.06
77	IIS University, Jaipur	152	19	448	8.00	0.38
78	Jain Vishva Bharati Institute, Ladnun	385	90	964	4.28	0.49
79	Janardan Rai Nagar Rajasthan Vidyapeeth, Udaipur	65	1	285	65.00	0.23
80	LNM Institute of Information Technology, Jaipur	145	25	325	5.80	0.52
81	Mody Institute of Education and Research, Sikar	84	196	250	0.43	1.12
82	Academy of Maritime Education and Training, Chennai	142	13	1000	10.92	0.16
83	Amrita Vishwa Vidyapeetham, Coimbatore	80	25	20721	3.20	0.01
84	Avinashilingam Institute for Home Science & Higher Education for Women, Coimbatore	27	2	1000	13.50	0.03

Table 6: Contd.,						
85	B.S. Abdur Rahman Institute of Science and Technology, Chennai	272	26	25414	10.46	0.01
86	Bharath Institute of Higher Education & Research, Chennai	129	22	39858	5.86	0.00
87	Chennai Mathematical Institute, Chennai	20	5	1000	4.00	0.03
88	Chettinad Academy of Research and Education (CARE), Kelambakkam	5	1	1000	5.00	0.01
89	Gandhiigram Rural Institute, Dindigul	229	32	1000	7.16	0.26
90	Hindustan Institute of Technology and Science (HITS), Chennai	267	227	4551	1.18	0.11
91	Kalasalingam Academy of Research and Higher Education, Krishnankoil, Virudhunagar	17	120	1000	0.14	0.14
92	Karunya Institute of Technology and Sciences, Coimbatore	48	44	6303	1.09	0.01
93	Karpagam Academy of Higher Education, Coimbatore	134	3	ERROR	44.67	0.00
94	M.G.R. Educational and Research Institute, Chennai	24	8	1000	3.00	0.03
95	Meenakshi Academy of Higher Education and Research, Chennai	25	3	655	8.33	0.04
96	Noorul Islam Centre for Higher Education, Kanyakumari	68	8	1000	8.50	0.08
97	Periyar Manaimmai Institute of Science and Technology (PMIST), Thanjavur	134	17	1000	7.88	0.15
98	Ponnaiyan Ramajayam Institute of Science and Technology (PRIST), Thanjavur	56	31	1000	1.81	0.09
99	S.R.M Institute of Science and Technology, Chennai	314	26	1251	12.08	0.27
100	Sathyabama Institute of Science and Technology, Chennai	144	33	1000	4.36	0.18
101	Saveetha Institute of Medical and Technical Sciences, Chennai	452	17	2295	26.59	0.20
102	Shanmugha Arts Science Technology and Research Academy (SASTRA), Thanjavur	123	24	4868	5.13	0.03
103	Sri Chandrasekharendra Saraswathi Vishwa Mahavidyalaya, Kanchipuram	148	7	623	21.14	0.25
104	Sri Ramachandra Medical College and Research Institute, Chennai	12	2	69926	6.00	0.00
105	St. Peter's Institute of Higher Education and Research, Chennai	121	9	1000	13.44	0.13
106	Vels Institute of Science Technology and Advanced Studies (VISTAS), Chennai	256	5	1000	51.20	0.26
107	Vellore Institute of Technology, Vellore	122	35	3086	3.49	0.05
108	Vel Tech Rangarajan Dr. Sagunthala R & D Institute of Science and Technology, Chennai	152	50	4711	3.04	0.04
109	Vinayaka Mission's Research Foundation, Salem	127	6	1347	21.17	0.10
110	International Institute of Information Technology, Hyderabad	73	16	1291	4.56	0.07
111	ICFAI Foundation for Higher Education, Hyderabad	28	9	1000	3.11	0.04
112	Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad	0	2	1590	0.00	0.00
113	Bhatkhande Music Institute, Lucknow	3	47	959	0.06	0.05
114	Central Institute of Higher Tibetan Studies, Varanasi	No Link		196	0.00	0.00

Table 6: Contd.,						
115	Dayalbagh Educational Institute, Agra	76	5	1613	15.20	0.05
116	Indian Institute of Information Technology, Allahabad	100	45	1000	2.22	0.15
117	Indian Veterinary Research Institute, Bareilly	191	11	957	17.36	0.21
118	Jaypee Institute of Information Technology, Noida	151	16	1000	9.44	0.17
119	Nehru Gram Bharati Vishwavidyalaya, Allahabad	1	0	530	0.00	0.00
120	Shobhit Institute of Engineering & Technology, Meerut	131	61	4668	2.15	0.04
121	Santosh University, Ghaziabad	76	16	755	4.75	0.12
122	Forest Research Institute, Dehradun	112	14	1000	8.00	0.13
123	Gurukul Kangri Vishwavidyalaya, Haridwar	19	136	184	0.14	0.84
124	Graphic Era University, Dehradun	No Link		673	0.00	0.00
125	Ramakrishna Mission Vivekananda Educational and Research Institute, Kolkata	13	1	1000	13.00	0.01

Ratio between Internal Link and External link for deemed university websites ranges between 0.06 and 112.0. Out of 125, 18 deemed universities by internal and external link is 0.00. This indicates that the 18 universities may not have either internal link and /or external link. Relation between Internal, External and Back Link has been calculated for deemed university websites ranges between 0.01 and 3.14. Out of 125, 21 deemed universities by either internal link, or external link or back link is 0.00. This indicates that the number of backlinks are least comparing to some of internal and external link.

Major Findings

- There are 741 universities are functioning in India. These universities are categorised as State University, Central University, Deemed University and Private University. Out of 741 universities, there were 125 (16.90%) Deemed universities. (Table 1)
- Out of 125 deemed universities, 78 (62.40%) were established in the 21st Century i.e. after the year 2001. There are 56 (44.80%) Arts and Science universities. It is followed by Engineering (39, 31.2%); Medicine (20, 16%) and others (10, 8%). (Table 2)
- 125 universities spread over 21 states in India. Out of 21 states, Tamil Nadu has a maximum of 28 (22.40%) universities, it is followed by Maharashtra 21(16.8%), Karnataka 14 (11.20%) and Uttar Pradesh 10 (8.00%). (Table 3)
- 56 (44.80%) universities are having a domain name as.ac.in. It is followed by edu.in 19 (15.20%).org 16 (12.80%) and.edu 12 (9.60%). (Table 4)
- The size of the websites ranges between 1 kb and 8529 kb. (Table 5)
- The Internal link ranges between 1 and 560 links. (Table 5)
- The External link ranges between 1 and 252 links. (Table 5)
- Web Impact Factor (WIF) for deemed university websites ranges between 0.01 and 3106.36. (Table 5)
- External Web Impact Factor (EWIF) for deemed university websites ranges between 0.01 and 116.83. (Table 5)

- Ratio between Internal Link and External link for deemed university websites ranges between 0.06 and 112.0. (Table 6)
- Relation between Internal, External and Back Link has been calculated for deemed university websites ranges between 0.01 and 3.14. (Table 6)
- The National University of Educational Planning and Administration has huge number of back links accounts to 108285 which indicate that this site has more number of rich files. It is followed by Indian Institute of Science 83790. (Table 6)
- Only 10 deemed universities have more than 10000 back links. (Table 6)

CONCLUSIONS

The web has increased in complexity over the years and has gradually transformed from an online publication medium to a platform for carrying out complex tasks such as shopping, learning, communication and collaboration. In this study the three key aspects such as internal link, external link and back link were used to measure the Indian Deemed university websites. Further the size of the websites were measured based on Kilobytes instead of number of hits. The size of the website were analysed based on Web Optimization Tool. Internal Web Impact Factor, External Web Impact Factor, the Ratio between in link, external link and back link were also calculated. In India, though almost all the academic institutions have their own web sites, however, many of them lacks a standard design and structure. The deemed university websites are dynamic and quite impressive because of their minimal website limited internal and external links even though it has number of images.

The recent years have witnessed the emergence of webometrics or cybermetrics (Jeyshankar, Ramesh Babu and Gopalakrishnan, 2009). The websites are playing important role in the webometric study which consists of web domain, sites and web pages. This study emphasized on the Internal Link; External Link and Back Link, Web Impact Factor for each website of deemed universities in India. So, it is suggested that the websites of deemed universities need to attract more links and impact factor by introducing novel and creative online services and updates of news and research information.

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